

Model Rocket Motor Igniter Examinations

1 Scope

These procedures describe the process for model rocket motor igniter examinations and applies to explosives and hazardous devices caseworking personnel who examine model rocket motor igniters and their post-blast remains to determine identifying and functionality information.

2 Introduction

Model rocket motor igniters are used by model hobbyists to initiate model rocket motors contained within a model rocket. Igniters are constructed from two lengths of wire which are attached to each other by a heat producing bridge wire. A heat sensitive pyrotechnic mixture is applied around the bridge wire. Upon completion of a current of electricity through the leg wires, the pyrotechnic material violently burns to initiate the rocket motor.

Model rocket motor igniters have been utilized in the fabrication of improvised explosive devices (IEDs) as a means of initiating low explosive main charges or very sensitive high explosive charges. These igniters may be found within electrical fuzing systems.

Depending upon the amount and type of recovered remains from the igniter, a specific manufacturer can be identified. This identification assists the investigator in identifying the individual(s) or group responsible for fabricating the IED.

3 Equipment/Material/Reagents

Below is a list of items that can be used to examine model rocket motor igniters and their post-blast remains. Explosives and hazardous devices personnel should choose the most appropriate items based on the nature of the evidence.

- Personal Protection Equipment (e.g., lab coat, eye protection, gloves)
- Hand tools (e.g., tweezers, pliers, utility knife)
- Cleaning materials and disinfectants (e.g., cloths, bleach, rubbing alcohol)
- Stereomicroscope (various magnifications)
- Ruler (e.g., standard 12 inch length)
- Micrometer
- Caliper
- Multimeter
- Pillboxes, glass containers, and static-proof plastic bags
- FBI Laboratory Explosives Reference Tool (EXPeRT) Database

- Reference texts, manuals, manufacturers' literature, and known materials are maintained in the Explosives library. Additional reference information can be obtained from direct contact with manufacturers and distributors.

4 Standards and Controls

Not applicable.

5 Sampling or Sample Selection

Not applicable.

6 Procedures

These procedures are implemented as part of the overall examination process outlined in the Device Examinations Standard Operating Procedure (SOP). Refer to the Safety section of this SOP before starting any examinations.

Explosives and hazardous devices personnel will:

6.1 Before any examination is conducted, ensure that the container and packaging have been appropriately marked in accordance with the *FBI Laboratory Operations Manual (LOM)* (i.e., item number, initials, and full Laboratory number, when practicable).

6.2 Care should be taken not to obliterate any identifying marks which have been previously placed on the igniter, or obliterate any microscopic marks of value.

6.3 Visually examine the item for any trace evidence that could be of value. This evidence could include, but not be limited to the following: hairs, fibers, blood, paint, or other particles.

6.3.1 If trace evidence is to be examined or preserved, contact the appropriate unit and determine if the material should be removed. Describe the material by means of notes, sketches, or photographs before it is removed.

6.4 Note the physical characteristics of the igniter through visual/microscopic examination. Physical measurements should be taken as well to aid in determining as many of the following attributes as possible:

- Construction characteristics
- Manufacturer
- Brand
- Type

- Special properties (e.g., physical condition, functionality, modifications made for use in IED)

6.5 If possible, determine the manufacturer, brand, and type by searching the EXPeRT database, Explosive reference files, manufacturers' literature, and/or reference or known materials collection. Identifications will be made by comparing observable/measurable physical characteristics with those provided in the above reference/literature materials.

7 Calculations

Not applicable.

8 Measurement Uncertainty

Not applicable.

9 Limitations

Refer to the Limitations section in the Device Examinations SOP and Appendix B of the Explosives and Hazardous Devices Report Writing Guidelines SOP.

10 Safety

Safety protocols, contained within the FBI Laboratory Safety Manual, will be observed at all times.

10.1 Intact igniters contain pyrotechnic materials which are extremely sensitive to heat, shock, and friction. Should they be accidentally initiated, they have the capability of producing fires and causing bodily injury. Therefore, igniters should be handled with care to preclude accidental initiation. The following guidance is provided:

10.1.1 When not under examination, igniters will be stored in the examiner's evidence locker.

10.1.2 Intact igniters will be stored in approved containers (i.e., static proof plastic bags).

10.1.3 Eye protection will be worn when handling intact igniters.

10.1.4 Intact igniters will not be examined at the same time or placed in proximity of explosives.

10.1.5 The leg wires of an igniter will be shunted to prevent static electricity or electromagnetic radiation (EMR) from initiating the igniter.

10.1.6 The leg wires will never be placed in a location where they could come in contact with a source of electrical energy unless the igniter is being purposely initiated.

10.2 Protective gloves (e.g., latex, nitrile) must be worn when handling igniters that have been possibly exposed to blood, tissue or other bodily fluids. Gloves will prevent exposure to possible hazardous material on the items as well as prevent DNA from being transferred to the items.

10.3 Model rocket igniters potentially bearing blood or other bodily fluids will be cleaned in a 2.5% bleach solution or other suitable disinfectant following discussions with personnel that may conduct other examinations of the igniters.

11 References

FBI Laboratory Division

FBI Laboratory Quality Assurance Manual, Federal Bureau of Investigation, Laboratory Division, latest revision.

FBI Laboratory Operations Manual, Federal Bureau of Investigation, Laboratory Division, latest revision.

FBI Laboratory Safety Manual, Federal Bureau of Investigation, Laboratory Division, latest revision.

Explosive Devices SOPs, Federal Bureau of Investigation, Laboratory Division, latest revisions.

Other

National Fire Protection Association (NFPA), NFPA 1122 Code for Model Rocketry, NFPA, 2008

Rev. #	Issue Date	History
0	07/07/2006	Original Issue to follow QATU formatting and ASCLD/LAB-International requirements
1	10/02/2017	Administrative changes for grammar, clarity, and conformance to revised QAM and LOM. Removed references to the Explosives Unit to applicability to those conducting explosives and hazardous devices related examinations. Deleted Calibration section since it is no longer required. Updated Limitations section to refer the reader to the Device Examination SOP and Appendix B of the Explosives and Hazardous Devices Report Writing Guidelines SOP. Updated references.

Approval

Redacted - Signatures on File

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